310-259

1,090,996

Great Britain

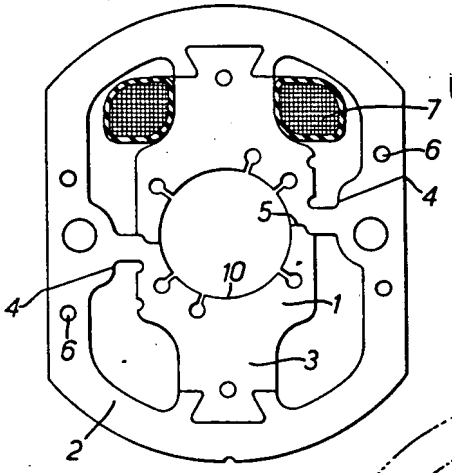
1090996

1 SHEET

PROVISIONAL SPECIFICATION

This drawing is a reproduction of the Original on a reduced scale

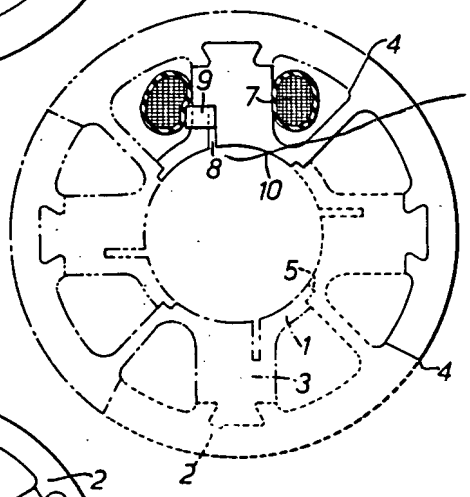
JEP



wound directly w/o former

dividing line between laws.

FIG. 1.



shading ring

FIG. 2.

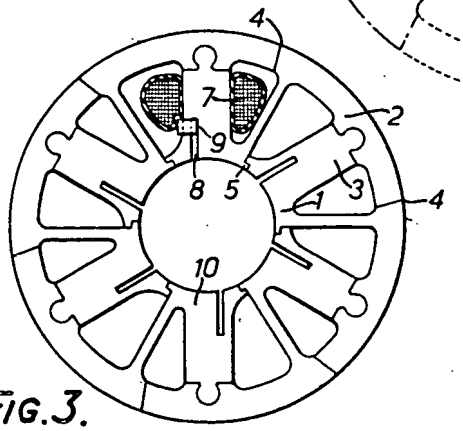


FIG. 3.

PATENT SPECIFICATION 1,090,996

DRAWINGS ATTACHED.

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1,090,996

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Int. Cl.:—**H 02 k 1/14.**

COMPLETE SPECIFICATION.

Improvements in or relating to Stators for Electric Motors.

We, RADIATION LIMITED, a British Company, of Radiation House, North Circular Road, London N.W.10., do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement: —

This invention relates to the construction of laminated stators for electric motors, particularly although not exclusively, of the induction type.

In known induction motors, the field coils wound on separate formers are carried on core pieces which in turn fit closely into laminations built up into a magnetic field yoke. Generally in the known motors the field coil is at one side and the magnetic field generated by it is transferred by the laminations and appropriately guided by magnetic reluctance breaks in the form of air slots, to the desired part of the rotor aperture periphery.

To facilitate production of the known construction, the field coils need to be slotted over core pieces and the latter then assembled with as close a fit as possible to the remainder of the laminations. However, any gap between the core pieces and the laminations introduces reluctance with consequence reduction in the effectiveness of the motor.

According to the present invention a laminated stator assembly for an electric motor is built up from a plurality of laminations each comprising a peripheral yoke portion and a pole piece portion having a stator field core portion, the pole piece portions and the yoke portions being formed with complementary parts shaped to effect keying or interlocking engagement with corresponding parts of similar laminations, the form of the laminations being such that two or more may be arranged so that their pole piece portions define a rotor aperture and so that a part of a pole piece portion engages a corresponding part of the yoke portion of the circumferentially adjacent lamination so that the assembled laminations present a continous outer peripheral magnetic circuit in which the keying or interlocking is such that separation of the laminations in a radial direction with respect to the rotor axis prevented.

Preferably that part of the pole piece portion that engages a corresponding part of the yoke portion of the circumferentially adjacent lamination is formed by a part of the stator field core portion.

According to a further feature of the invention, each fieldcore portion of an assembly of laminations which constitutes a half or other equi-fractional part of a complete assembly is so shaped that a field coil may be directly wound thereon prior to the fitting together of the two halves or multiple equi-fractional parts.

In particular stator assemblies embodying the invention the mating surfaces of the pole piece portions are shaped to produce concentricity of the parts comprising an assembly.

Alternative forms of stator assembly embodying the invention will now be described in greater detail by way of example with reference to the drawing which accompanied the Provisional Specification in which: —

Figure 1 is a cross-sectional view taken at right angles to the axis of a shaded pole motor with a two pole stator, showing only one field coil in position,

[*Price* 4*s.* 6*d.*]

Figure 2 is a similar view of a four pole stator, and

Figure 3 is again a similar view of a six pole stator.

Referring to the drawings, it will be seen that in each of the figures each lamination comprises a pole piece portion 1 and a yoke portion 2, the pole piece portion 1 having a stator field core portion 3. Each lamination is so shaped that in the respective cases, that is to say for a two, four or six pole stator, identical laminations can be built up into a complete pole and yoke sequence. The dividing lines between the individual laminations as indicated at 4, are symmetrical and each lamination includes shaped keying surfaces indicated at 5 to ensure that the assembled laminations lock together in the correct form to present a continuous outer peripheral magnetic circuit.

Bolts or rivets driven through holes 6 enable a block of laminations to be built up to any thickness without requiring any circumferential casing to hold the assembled laminations together. The whole motor comprises a stator and a rotor, the latter being arranged in known manner to prevent lateral separation of the laminations.

The stator field core portions 3 are parallel sided and thus enable simple field coil windings 7 to be wound over them directly without the need for a former. Where the fitting of a shading ring is necessary slots 8 are provided to facilitate the fitting of a shading ring 9, Figures 2 and 3. Separate field core portions for the field coil windings are not required because the core portions 3 and the pole faces 10 are integrally formed into single pole piece portions.

After assembly of the field coils and a shading ring where required, the separate sets of laminations are press fitted together in a manner analogous to the piecing together of a jig-saw puzzle.

The stamping dies for the individual laminations can be so designed that the mating edges are not burred or retracted but rather are slightly pinched outwards so that they fit their corresponding edges in the assembly very closely without undesirable gapping.

It will be seen that by utilising the invention the production of undesirable air gaps is avoided and ensures continuity of the magnetic circuit. Furthermore, the whole yoke assembly can be automatically keyed by a simple push fit operation.

It will be evident that although the application of the invention has only been described with reference to shaded pole motors it may be applied to any motor of the induction type.

WHAT WE CLAIM IS: —

1. A laminated stator assembly for an electric motor built up from a plurality of laminations each comprising a peripheral yoke portion and a pole piece portion having a stator field core portion, the pole piece portions and the yoke portions being formed with complementary parts shaped to effect keying or interlocking engagement with corresponding parts of similar laminations, the form of the laminations being such that two or more may be arranged so that their pole piece portions define a rotor aperture and so that a part of a pole piece portion engages a corresponding part of the yoke portion of the circumferentially adjacent lamination so that the assembled laminations present a continuous outer peripheral magnetic circuit, in which the keying or interlocking is such that separation of the laminations in a radial direction with respect to the rotor axis is prevented.

2. A laminated stator assembly as claimed in claim 1 wherein that part of the pole piece portion that engages a corresponding part of the yoke portion of the circumferentially adjacent lamination is formed by a part of the stator field core portion.

3. A laminated stator assembly as claimed in claim 1 or claim 2 wherein each field core portion of an assembly of laminations constituting a half or other equi-fractional part of a complete assembly is so shaped that a field coil may be directly fitted thereon prior to the fitting together of the two halves or multiple equi-fractional parts.

4. A laminated stator assembly as claimed in any one of claims 1 to 3 in which the mating surfaces of the pole piece portions are shaped to produce concentricity of the parts comprising an assembly.

5. A laminated stator assembly as claimed in any one of claims 1 to 4 wherein an assembly of laminations is held together by means of bolts or rivets.

6. An electric motor including a stator assembly as claimed in any one of claims 1 to 5.

7. A stator assembly substantially as hereinbefore described and illustrated with reference to Figure 1 or Figure 2 or Figure 3 of the drawing accompanying the Provisional Specification.

8. An electric motor as claimed in claim 6 substantially as hereinbefore described and illustrated with reference to Figure 1 or Figure 2 or Figure 3 of the drawing accompanying the Provisional Specification.

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